GEL'MAN, A.S., dokter tekhnicheskikh nauk, professor; POPOV, V.S., kandidat
tekhnicheskikh nauk.

Effect of the initial structure of 12Kh2MFB steel on its fusion welding.
Stal' 16 no.3:241-243 Mr '56.   (MIRA 9:7)

1.TSentral'nyy nauchno-issledovatel'skiy institut mashinostroyeniya i me-
talloobrabotki.
(Steel--Metallography) (Pipes, Steel--Welding)

GEL'MAN, A.S., doktor tekhnicheskikh nauk, professor; KABANOV, N.S.;
SLEPAK, E.S.; LEBEDEV, V.K., kandidat tekhnicheskikh nauk, retsenzent;
MEZHOVA, V.A., nauchnyy redaktor; TIKHANOV, A.Ya., tekhnicheskiy
redaktor

[Contact butt-welding of pipes] Kontaktnaia stykovaia svarka trub.
Pod red. A.S.Gel'mana. Moskva, Gos.nauchno-tekhn.izd-vo mashino-
stroit. lit-ry, 1957. 231 p.   (MLRA 10:8)
        (Electric welding)   (Pipe, Steel)

FLINN, A. S.

BALKOVETS, Dmitriy Stepanovich; ORLOV, Boris Dmitriyevich; CHULOSHNIKOV,
Pavel Leonidovich; GEL'MAN, A.S., doktor tekhnicheskikh nauk,
professor, retsenzent; POLYAVKO, N.V., kandidat tekhnicheskikh
nauk, retsenzent; VEYS, A.L., kandidat tekhnicheskikh nauk,
redaktor; BOGOMOLOVA, M.F., izdatel'skiy redaktor; ROZHIN, V.P.,
tekhnicheskiy redaktor

[Spot and roll welding of special steels and alloys] Tochechnaia i
rolikovaia svarka spetsial'nykh stalei i splavov. Moskva, Gos.izd-vo
obor.promyshl., 1957. 429 p.
(MIRA 10:9)
(Welding)

SOV/137-58-11-22872

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 149 (USSR)

AUTHOR: Gel'man, A. S.

TITLE: How to Apply Welding More Effectively (Povysheniye effektivnosti ispol'zovaniya svarki)

PERIODICAL: V sb.: Vopr. povysheniya proizvoditel'nosti truda v mashinostr. Moscow, Mashgiz, 1957, pp 303-320

ABSTRACT: The author examines the basic trends in machine-building industry toward a more efficient utilization of welding (W) procedures. An analysis of a number of welding operations and conditions of their employment indicates that considerable margins are available for the improvement of production figures of welding operations employed in machine building. In order to realize these margins, the following measures must be carried out: a) The fields of employment of the various types of welded structures should be expanded; b) only the most profitable techniques should be employed. This includes replacement of submerged-arc multipass W of steel 40-50 mm thick by electrical slag W; substitution of manual arc W by W in an atmosphere of CO_2; substitution of arc and torch W of thin steel by spot

Card 1/2

How to Apply Welding More Effectively

welding and roller-type seam W; c) the efficiency of W processes should be increased through the employment of large-diameter electrodes in manual arc W, introduction of multi-spot W machines in resistance W in conjunction with mechanization of the associated auxiliary operations; plans for the future should include employment of integral mechanization and automation of assembling and welding operations together with the introduction of multi-operational machines and automated and continuous-production lines.

B. V.

Card 2/2

GEL'MAN, A-J.

135-2-1/12

SUBJECT: USSR/Welding

AUTHOR: Gel'man, A.S., Professor, Doctor of Technical Sciences.

TITLE: Fusion welding of aluminum alloy AK-6. (Svarka oplavleniyem aluminiyevogo splava AK-6).

PERIODICAL: "Svarochnoye Proisvodstvo", 1957, #2, pp 1-5 (USSR).

ABSTRACT: The article deals with experimental investigation of weldability of the aluminum alloy AK-6, in order to determine the commercial advisability of welding on circular sections and flanges instead of casting complete parts.

Alloy AK-6 contains: 1.8 - 2.6 % Cu; 0.4 - 0.8 % Mg; 0.4-0.8 % Mn; 0.7 - 1.2 % Si. It represents a dispersion-hardening alloy which becomes after quenching (from 505-515°C) a hard aluminum solution. After aging (150 - 160° during 12-15 hours) the strengthening phases $CuAl_2$, Mg_2Si, and $Al_{10}Cu_5Mg_6$ precipitate from the hard solution.

The welding experiments were performed on welding machine UKS MM-12 of 200 kva, equipped with a pneumo-hydraulic drive with

Card 1/2

TITLE: Fusion welding of aluminum alloy AK-6. (Svarka oplavleniyem
aluminiyevogo splava AK-6).   135-2-1/12

maximum pressure of 12 tons and maximum setting speed of 100
mm/sec. It was concluded that good joints are obtained by
welding 7 to 15 mm/sec, duration of process 1.2 - 1.5 sec,
and setting speed not below 100 mm/sec. Welding with simul-
taneous cutting off the fins (2) was found practical. The
experiments were performed by the instructor and Chief of the
Laboratory of Contact Welding of TsNIITMASH, A. S. OVCHINIKOV.

The article contains 5 tables, 7 diagrams, 6 micro-photographs,
and 4 references (3 of which areRussian).

INSTITUTION: ЦНИИТМАШ (TsNIITMASH)

PRESENTED BY:

SUBMITTED:

AVAILABLE: At the Library of Congress

Card 2/2

Gel'MAN, A.S.

135-6-11/13

SUBJECT: USSR/Welding

AUTHOR: Professor Gel'man A.S., Doctor of Technical Sciences.

TITLE: The "MCT -200" Machine for Butt Welding of Pipes up to 76 mm Diameter. (Mashina "MCT -200" dlya stykevoy svarki trub diame-trem do 76 mm).

PERIODICAL: "Svarochnoye Proizvodstvo", 1957, # 6, p 26 (USSR)

ABSTRACT: The article contains description, technical characteristics and drawings of the welding machine "MCT-200" developed by the plant "Elektrik" according to plans made by the Central Research Institute for Heavy Machinebuilding "TsNIITMASh".

The machine is designed for automatic butt welding of boiler tubes of austenitic and perlitic steels, with continuous fusion, or with fusion and preheating. It is provided with a hydro-pneumatic drive, with double pneumatic clamps (the current conducting clamps with a maximum power of 16 tons, and additional clamps with clamping power of 24 tons) and a set of change clamps of lighter type for welding coiled tube elements.

The automatic control is designed by "TsNIITMASh" (see "Avtogen-noye Delo" No. 1, 1952). It comprises the additional winding

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135-6-11/13

TITLE: The "MCT-200" Machine for Butt Welding of Pipes up to 76 mm
          Diameter. (Mashina 'MCT-200' dlya stykovoy svarki trub
          diametrom do 76 mm).

          of the welding transformer, which feeds the voltage relay.
          When the secondary voltage drops below the fixed range as a
          result of voltage drop in the line, the automatic blocking
          prevents the start of welding.

          The article contains 3 drawings.

ASSOCIATION: Not stated.

PRESENTED BY:

SUBMITTED:

AVAILABLE: At the Library of Congress.

Card 2/2

GEL'MIN, A.S.

GEL'MAN, A.S., doktor tekhn.nauk

State of and margin for future development of resistance welding.
Svar.proizv.no.11:31-34 N '57.   (MIRA 10:12)
                              (Electric welding)

Gel'man, A.S.

129-3-4/14

AUTHORS: Gel'man, A.S., Griboyedova, T.S., Ye.A. Davidovskaya, Lazarev, B.I., Lyubavskiy, K.V., Slepak, E.S., Trunin, I.I. and Fedortsov-Lutikov, G.P.

TITLE: Investigation of the Steel 1Kh18H12T as Tube Material for Power-generation Equipment (Issledovaniye stali 1Kh18N12T v kachestve trubnogo materiala dlya energoustanovok)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.3, pp. 16 - 24 (USSR).

ABSTRACT: For producing tubes operating at super-critical steam parameters, it is necessary to have available a cheap, strong and ductile material which has a stable structure and stable properties at 550 to 650 °C, is not inclined to develop inter-crystallite corrosion and possesses good technological properties. The work carried out in 1952 and 1953 by TsNIITMASh jointly with the imeni Ordzhonikidze Works (Ref.1) proved that it was possible to utilise cheap steel of the type 1Kh18H9T for operation at high temperatures. Later, complex investigations were carried out with this steel as a material for tubes of super-critical parameter power-generation equipment. The steel 1Kh18H9T may contain large quantities of ferrite and, after long-duration annealing at 600 to 700 °C, it embrittles due to the formation of a σ-phase. Increase in the nickel content

Card1/4

129-3-4/14

Investigation of the Steel 1X18H12T as Tube Material for Power-
generation Equipment

to 11-13% brought about an appreciable increase in the stability
of the austenite without affecting the high strength.   This
steel, designated as 1X18H12T steel, does not show any α- or
σ-phase separation during ageing at 700 °C for 10 000 hours
and at 750 °C for 3 000 hours; only slight quantities of
carbides were found to separate out. Thereby, the impact
strength is maintained at 22-24 kg/cm² for this steel, whilst
in the case of the steel 1X18H9T, it drops to 9-18 kg/cm². The
investigations described in this paper were carried out on commercial
tubes, rods and also on laboratory produced steels with
compositions as given in Table 1, p.16. The results are entered
in tables and plotted in graphs. It is concluded that the steel
1X18H12T, containing 0.08-0.12% C, max. 75% Si, 1-2% Mn, 17-18.5%
Cr, 11-13% Ni, max. 0.20% S and max. 0.035% P, is suitable for
operation at high temperatures; the Ti content of the steel
is thereby determined by means of the formula 5(C-0.02). The
best combination of mechanical properties was obtained after
annealing at 1 050 to 1 100 °C for 30 min. and cooling in air,
and this regime is recommended for tubes as well as for bends.
Weld joints should be annealed at 1 000 to 1 050 °C for 1 hour
Card2/4 and then cooled in air. The mechanical properties of steels

129-3-4/14

Investigation of the Steel 1X18H12T as Tube Material for Power-generation Equipment

heat-treated in accordance with these recommendations are entered in Table 6, p.24, for test temperatures of 20, 600, 650 and 700 °C. Practically no embrittlement takes place for this steel after ageing at 600 and 750 °C for durations of 3 000 to 10 000 hours; no σ-phase formation could be detected after such ageing for steel containing 12% Ni, whilst under similar conditions, σ-phase formation can occur in steel containing 10 % Ni. Preliminary, non-uniform work-hardening influences the ultimate strength of the steel, but does not influence appreciably the ductility in the case of long-duration loading. In the case of contact-welding of tubes of superheaters, the strength of non-heat-treated weld joints is not lower than that of the base metal. Steam at 600 °C and long-duration tests for up to 3 000 hours do not affect appreciably the long-duration strength of the steel and of welded joints. The steels 1X18H12T and 1X18H9T are less inclined to develop thermal fatigue than the steel 1X14H14B2M, and the authors recommend using the steel 1X18H12T for tubes of power-generating equipment, operating with steam of super-critical parameters. There are 5 figures, 6 tables and 8 references, 5 of which are Russian, and 3 English.

Card3/4

ASSOCIATION: TsNIITMASh

AVAILABLE: Library of Congress

135-58-7-5/20

AUTHOR: Gel'man, A.S., Doctor of Technical Sciences, and Kitayev, A.M.,
              Candidate of Technical Sciences

TITLE: Roller Butt Welding with Straps (Rolikovaya svarka vstyk s
              nakladkami)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 7, pp 17-19 (USSR)

ABSTRACT: The article presents results of experiments on roller butt
              welding of sheet steel with the use of straps. The materials
              used in experiments were low-carbon steel, "Kh17N2" chrome-
              steel, "1Kh8N9T" stainless steel, and "VT-1D" commercial ti-
              tanium; the straps in all experiments were made of "1Kh18N9T"
              steel of 0.3 mm thickness and 4 mm width. This material was
              chosen because of its high electrical resistance and low heat
              conductivity. After tests, the following conclusions were
              made: 1) blanks welded with straps can be subjected to stamping
              with deep drawing, bending and other shape-changing operations;
              2) the described welding method can be used for sheets of over
              3 mm thickness, unlike the overlap welding method; 3) the
              strength of welds under static and alternate loads does not
Card 1/2   differ from the strength of overlap joints produced by roller

Roller Butt Welding with Straps

135-58-7-5/20

welding.
There are 4 tables, 2 graphs, 2 diagrams and 4 photographs.

1. Spot welding--Test results   2. Steel--Spot welding

Card 2/2

GEL'MAN, A. S.   (TsNIITMASh)

"The Needs of the Heavy Machine Building Industry for Welding Equipment,"

All-Union Conference on Prospects and Trends of the Development of Electric
Welding Equipment in the USSR fro 1959-1965

Svarochnoye Proizvodstvo, 1958, Nr 6, pp 13-17

AUTHOR: Professor Gel'man, A.S.   SOV/110-58-8-23/26

TITLE: On the Rigidity of Spot-Welding Machines (O zhestkosti
          kontaktnykh svarochnykh mashin)

PERIODICAL: Vestnik Elektropromyshlennosti,1958,Nr 8,p 76 (USSR)

ABSTRACT: This is a brief discussion of an article by Candidate of
          Technical Science Shrayer, A.B., published in Vestnik
          Elektropromyshlennosti Nr 9, 1957. The article considered
          a case of distortion in a welding machine with vertical
          travel of the upper electrode. The author's conclusion
          was that the absolute rigidity of the machine did not
          influence the welding conditions. However, this conclusion
          is not valid for machines with radial electrode traverse,
          which are coming into more general use. In these,

Card 1/2

On the Rigidity of Spot-welding Machines

SOV/110-58-8-23/26

distortion of the machine affects the welding conditions, so that the clauses concerning rigidity remain an essential part of the standard specification.

There is 1 figure; no literature references

1. Spot welding--Equipment   2. Machines--Stability

Card 2/2

SOV-135-58-9-9/20

AUTHORS: Gel'man, A.S., Doctor of Technical Sciences, Professor, Mel'-
              bard, S.N., Engineer, Sinadskiy, S.Ye., Candidate of Tech-
              nical Sciences, and Cheshev, P.I., Engineer

TITLE: Electric Slag Welding of Hydro-Turbine Shafts (Elektroshlak-
              ovaya svarka vala gidroturbiny so svarnoy obechaykoy)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 9, pp 26-32 (USSR)

ABSTRACT: Information is presented on experimental work conducted by
              I.R. Kryamin, at the TsNIITMASH, together with LMZ, NKMZ,
              KhTGZ, NKMZ and the Izhorskiy Plant on the development of ma-
              terials and technology for the production of welded shafts
              of powerful hydro-turbines with the use of the electric-slag
              welding process. In this connection, weldability of "20GSL"
              and "20GS" steel was investigated, welding technology was
              developed, and tests were carried out on turbine shafts for
              the Stalingrad GES. The following personalities participat-
              ed in the work: Candidate of Technical Sciences I.L. Brin-
              berg, and Engineers A.I. Rymkevich, A.D. Kuznetsova-Sadov-
              nikova, N.I. Malyavkina. From LMZ: Engineers V.I. Faust,
              V.D. Averin, Z.M. Gamze, G.A. Branovskiy, G.I. Mart'yanov,
Card 1/2   R.K. Fasulati and the welding operators V.A. Petrov, M.I.

, Electric Slag Welding of Hydro-Turbine Shafts   SOV-135-58-9-9/20

Gorbachev, M.A. Grinovskiy. Technical economical analyses
were carried out by Engineer S.P. Golosovskiy (TsNIITMASh).
It was proved that "20GSL" and forged "20GS" steel can be
successfully welded by the electric-slag method if the steel
had been properly cast. Information includes detailed re-
commendations including technology and materials. There
are 7 tables, 4 graphs, 3 diagrams, 4 photos and 5 Soviet
references.

ASSOCIATION: TsNIITMASh

1. Turbines   2. Shafts--Welding   3. Arc welding--Applications

Card 2/2

25 (0)   SOV/135-59-4-17/18

AUTHOR: Gel'man, A. S., Doctor of Technical Sciences

TITLE: A Review of the Book "Electric Contact Welding" by N. P.
              Sergeyev and M. S. Feygenson, Second Edition, Revised and
              Supplemented. Mashgiz 1958 (Retsenziya na knigu N. P.
              Sergeyeva i M. S. Feygensona "Elektricheskaya kontaktnaya
              svarka". Izdaniye vtoroye, pererabotannoye i dopolnennoye
              Mashgiz 1958)

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 4, pp 45 - 46   (USSR)

ABSTRACT: The subject book is a manual of 282 pages, written for fore-
              men and team-leaders of assembly shops of machine building
              plants, suitable also for welders and mechanics. The author
              considers the book on the whole useful and plainly written but
              points out the following shortcomings: 1) it includes de-
              tailed descriptions of equipment that never was actually
              in use; 2) omits some processes and some equipment units
              that are now in use; 3) contains erroneous statements (a
              long series of such statements are cited) 4) contradictory
Card 1/2   or unclear recommendations. He says that the authors must

A Review of the Book "Electric Contact Welding" by N. P. Sergeyev and
M. S. Feygenson, Second Edition, Revised and Supplemented. Mashgiz 1958

SOV/135-59-4-17/18

consider all the minor faults of the book if they are to
improve it, but that the second edition contains less
faults than the first.

Card 2/2

18(5), 25(1,5)

AUTHORS: Gel'man, A.S. Doctor of Technical Sciences, Professor,
and Slepak, E.S., Candidate of Technical Sciences
(TsNIITMASh),Iashchiver, S.M., Candidate of Technical
Sciences (NIITAVTOPROM), Mamrikov, E.V., (Mytishch'
Machine Building Plant)

TITLE: Projection Spot Welding of Hot Rolled Steel

ABSTRACT: The authors review the experience in projection spot-
welding of hot-rolled steel sheets at the Mytishchin-
skiy mashinostroitel'nyy zavod (Mytishchi Machine
Building Plant). This method was suggested by TsNIIT-
MASh several years ago, then studied by NIITAVTOPROM
and finally it was introduced at the aforementioned
plant. There it is used for the manufacture of semi-
trailer parts with satisfactory results. The authors
present operational data in tables and graphs. There
are 3 photographs, 4 diagrams, 3 tables and 1 graph.

Card 1/2

SOV/178-59-7-6/15

Projection Spot Welding of Hot Rolled Steel

ASSOCIATION: TsNIITMASh; NIITAVTOPROM; Mytishchinskiy mashino-
stroitel'nyy zavod (Mytishchi Machine Building
Plant)

Card 2/2

18(5) 25(1,5)

SOV/135-59-7-10/15

AUTHORS: Kogos, A.M., Ryss, B.A., Engineers,
              Gel'man, A.S, Doctor of Technical Sciences, Professor,
              Kabanov, N.S., Candidate of Technical Sciences

TITLE: Resistance Welding in Steel Sheet Production

ABSTRACT: The experience in introducing resistance butt wel-
              ding at metallurgical plants showed that resistance
              welding may produce an essential engineering and
              economic effect, especially, when together with a well
              adjusted butt welding machine some other, higher re-
              quirements of the metal strip are met. The equipment
              developed and the technology of butt-welding of strips
              which was tested under difficult work conditions of
              metallurgical plants, is a means for increasing the
              productivity of machinery for cold-rolling of sheets.
              This process must find wide-spread application in new
              rolling-mill shops which are to be constructed in ac-
              cordance with the Seven-Year-Plan. In table 1 the
Card 1/2   authors present basic data of TsNIITMASh butt welding

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Resistance Welding in Steel Sheet Production

machines. Such equipment was developed by TsNIITMASh during the past years and was installed at the plants "Elektrostal'", "Zaporozhstal'", "agnitogorskiy metallurgicneskiy kombinat (Magnitogorsk Metallurgical Combine). Fig. 2 shows a welding machine 1700 built by EZTM, used for welding steel strips in a rolling mill, whereby such processes as pickling, tinning, etc. may be performed continously. In table 2 the authors present data for welding low carbon steel strips at welding machines 1600 and 1700. Ther are 2 photographs, 9 diagrams, 2 tables and 1 graph.

ASSOCIATION: TsNIITMASh

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SOV/135-59-10-8/23

18(5)

AUTHORS: Gel'man, A.S., Doctor of Technical Sciences, Professor, and San-
              der, M.P., Engineer

TITLE: Power Demand and Heating During Friction Welding of Steel Pipes
              With Thick Walls

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 10, pp 18-20 (USSR)

ABSTRACT: Experiments were carried out in TsNIITMASh to investigate the
              emission and distribution of heat during friction welding of pipe
              elements up to 160 mm in diameter and, concurrently, the optimum
              parameter was determined. It was found that the variation of the
              power demand is a function of the frictional coefficient which,
              in turn, is dependent on the specific pressure, the angular velo-
              city, and the temperature. These parameters of the frictional co-
              efficient were studied during friction welding of pipe elements.
              To determine the frictional coefficient required for a certain
              power and vice versa, different calculation methods are briefly
              elaborated, which were also verified by experiments, during which
Card 1/3   the power and frictional coefficient were varied alternately. It

SOV/135-59-10-8/23

Power Demand and Heating During Friction Welding of Steel Pipes With Thick Walls

was found that the slow increase of the power demand at the begin-
ning of the process (Fig.1) is not solely influenced by the fric-
tional coefficient as the temperature increases, but is also a
function of the gradually increasing pressure between the contact-
ing surfaces. It is emphasized that the heat distribution during
the initial state shows a random characteristic and is only de-
pendent on the actual arrangement of the contacting points. The
authors provide the summary of the experiments stating that with
the increasing temperature, the frictional coefficient increases
initially and then decreases as the process continues. In the
examined range the increase of the linear velocity and the pres-
sure result in a diminishing frictional coefficient. The character-
istics of the power demand are analogous. For the better utiliza-
tion of welding equipment it is recommended that the process be
initiated at relatively low pressure and as the desired tempera-
ture is attained, the pressure be increased gradually. In the
described manner the heat distribution is acceptable both radial-
ly as well as in the perimeter of the welding seam. Taking into

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Power Demand and Heating During Friction Welding of Steel Pipes With Thick Walls

account the fast heat distribution at the ends, the calculation of the power demand has to be based on the assumption of wear of the ends by rotation. There are 2 photographs, 1 diagram, 4 graphs and 3 references, 2 of which are Soviet and 1 Czech.

ASSOCIATION: TsNIITMASh

Card 3/3

83680

S/135/60/000/010/002/015
A006/A001

l:2300 ·only 2208

AUTHORS: Gel'man, A. S., Professor, Doctor of Technical Sciences, Mel'bard, S. N., Bogdanov, V. N., De-Millo, P. G., Grum-Grzhimaylo, I. A., Engineers

TITLE: Pipe Welding by Radio-Frequency Current

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 10, pp. 4-7

TEXT: The welding of up to 6 mm thick pipes by radio-frequency current was first investigated in 1958 at TsNIITMASh. Further studies were performed together with NIITVCh. The following personalities participated in the work: from TsNIITMASh: I. L. Brinberg, Candidate of Technical Sciences; from VNIIMETMASh: V. V. Nosal', Doctor of Technical Sciences, Anisiforov, Candidate of Technical Sciences, N. A. Sarychev, and V. S. Antsiferov, engineers; from NIITVCh: N. P. Glukhanov, Candidate of Technical Sciences. On a laboratory installation (Fig. 2) strips with chamfered edges were drawn by clamping rollers at a required opening angle between the edges to be welded (α). The overlap of the strips was fixed by supporting rollers. Radio frequency current was fed to the edges through sliding contacts. The current was concentrated on the edge

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A006/A001

Pipe Welding by Radio-Frequency Current

surface and penetrated to a depth of 0.04 - 0.12 mm. The molten metal was pressed by the rollers thus forming the welded joint. The welding speed was 3.5 - 20 m/min. The magnitude of compression ranged from 0 to 4,000 kg. Experimental welds were made on 3 - 6 mm thick carbon steel strips with chamfered edges. Specimens of the welds were subjected to static tests and showed a strength equalling that of the base metal. The quality of the joint is determined by the uniform heating of the edges. Stable heating conditions are obtained at an opening angle of the edges not below 4°. The uniformity of heating is enhanced by a greater slope of the chamfer (β). Best results were obtained at $\beta = 42^{\circ}$. The quality of the welds depends moreover to a high degree on the dimension of the overlap which must be maintained with great accuracy. Satisfactory results when welding 3 mm thick strips were obtained under the following conditions: electric generator of 9 kw voltage and 9 amp current intensity; 6 m/min welding speed; 4,000 kg compressive force. It was established that the quality of joints when welding 3 - 6 mm thick strips was improved by increasing the compression of the edges in the welding area. Welding conditions for chamfered strips are given in Table 1 and mechanical properties of joints are represented in Table 2 and 3. Overlap welding of chamfered edges with radio frequency current may be used for the production of pipes with helical seams and for

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Pipe Welding by Radio-Frequency Current

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large-diameter pipes with straight seams. Welding without chamfering is simpler and may be used when the structures to be welded permit such type of joint. There are 7 figures and 3 tables.

ASSOCIATION: TsNIITMASh (Gel'man, Mel'bard); NIITVCh (Bogdanov, De-Millo); VNIIMETMASh (Grum-Grzhimaylo

Card 3/3

GEL'MAN, Aleksandr Samuilovich, doktor tekhn. nauk, prof.; BALKOVETS, D.S.,
doktor tekhn. nauk, red.; ALOV, A.A., doktor tekhn. nauk, prof.,
retsenzent; SOBOLEVA, G.N., red. izd-va; CHERNOVA, Z.I., tekhn.
red.

[Technology and equipment for resistance welding] Tekhnologiia i oboru-
dovanie kontaktnoi elektrosvarki. Moskva, Gos. nauchno-tekhn. izd-vo
mashinostroit. lit-ry, 1960. 367 p.   (MIRA 14:7)
            (Electric welding--Equipment and supplies)

20225

S/135/61/000/004/001/012
A006/A101

| .230

AUTHORS: Gel'man, A. S., Professor, Doctor of Technical Sciences, Pavlich-
enko, V. S., Engineer

TITLE: The Effect of Real and Inductive Resistance of a Butt-Welding Ma-
chine on the Flash-Welding Process

PERIODICAL: Svarochnoye proizvodstvo, 1961. No. 4, pp. 1 - 6

TEXT: Investigations made by TsNIITMASh and the Institute of Electric
Welding imeni Ye.O. Paton, have shown that the electrical parameters of a butt-
welding machine, strongly affect the flash welding process. The authors studied
separately the effects of real and inductive resistance of the welding machine on
the magnitude of minimum voltage (U_{2_0min}), necessary for the excitation and main-
tenance of continuous flashing; the nature of the flashing process; the shape
of flashed butts, the effective thermal efficiency of the process; the quality
of weld joints; the heating of the parts to be flash-welded; the power consumed,
the effective current and the effective resistance of the welding zone. All the
experiments were carried out on a 150 kvamp machine. Changes in the real resist-
ance of the primary circuit were produced by a ballast rheostat RB - 300 ($R_1 \le$

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S/135/61/000/004/001/012
A006/A101

The Effect of Real and Inductive Resistance of a Butt-Welding Machine on the Flash-Welding Process

0.34 ohm) and in the induction resistance by two welding chokes connected in series ($X_1 \leqslant 1.2$ ohm at 100 amp current in the primary circuit). The experiments were made with 32 x 3.5 mm "20" grade steel pipes. The following flash welding conditions were employed, assuring satisfactory weld joints without additional resistance: adjusted length -40 + 40 mm; duration of cycle -12 sec; flashing distance -11 mm; mean flashing speed 0.92 mm/sec; maximum flashing speed prior to upsetting 1.7 mm/sec; upset distance 4.5 mm; upset speed 50 mm/sec. The effect of the machine resistance was evaluated by current and voltage oscillograms, recorded on the ΜΠΟ -2 (MPO-2) oscillograph. Due to the similarity of both the primary and secondary current curves, already previously observed by V. Ya. Khazov (Ref. 6), only the primary current was oscillographed. In studying the effect of the machine resistance on the minimum idle run voltage and the nature of the flashing process it was found that at constant parameters, the increase of real resistance (Figure 2) affected the value U_{20}min much more than the corresponding increase of inductive resistance. This confirms the dependence previously established by V. K. Lebedev and G. V. Barburov (Ref. 4). The oscillograms obtained show that the current never changes its sign within one half-period which confirms V. Ya. Khazov's conclusion (Ref. 7) on the absence of a cross piece of a

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dynamic capacitor during the break, as was previously assumed (Ref. 1). The effect of the resistance on the depth of craters in the pipes is shown in figure 4. The effect of the machine resistance on the heating of pipes was studied by measuring the temperature with chromel-alumel thermocouples (Fig. 5a) and by recording calorimetrically the heat content of the flashed pipe at the end of the process and during intermediate periods. Temperature distribution curves are given in Fig. 5. It was found that an increase in the real resistance in both the primary and secondary circuits impaired the heating conditions (drop of temperature) which is probably due to the reduced existence and the size of fused metal cross pieces between the butts. The effect of the resistance on the active power consumed during flashing was determined from oscillographic recordings and calculations on the basis of indices from a single-phase electric power meter. The effective thermal efficiency of the flashing process η fl, was determined by formula (1) η fl $= \dfrac{Q_d}{Q_d + Q_{br}}$ (where Q_d is the heat contained in the flashed parts,

Q_{br} is the heat emanated during the flashing process with the metal splashings),

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Flash-Welding Process

and the equation of heat balance (2) $Q_{tot} = Q_1 + Q_2 + Q_d + Q_{br} + Q_n$, where Q_{tot} is
the total amount of heat in cal liberated during flashing process; Q_1 and Q_2 are
the heats emanated in the primary and secondary circuits of the machine and Q_n is
the heat loss. Formulae are also given for determining the effective current dur-
ing flashing; the effective welding current, the effective resistance of the
welding zone and the effective resistance of the welding circuit. Results are
given in Figure 7. It was established that the resistance of the machine did
practically not affect the number of pulses but affected strongly the effective
flashing resistance. This is in a certain disagreement with V. Ya. Khazov's con-
clusions that the flashing resistance is directly affected only by the inductivi-
ty of the welding circuit and the duration of closing and breaking of the welding
circuit. As a result of the investigation performed the authors draw the follow-
ing conclusions: An increased resistance of the machine causes a considerable in-
crease of the minimum idle-run voltage, necessary to maintain the flashing process.
The strong effect of the real resistance is confirmed (due to high cos φ during
the flashing). Increased resistance of the machine reduces the stability of flash-
ing (carried out at U_{2_0min}). However, at a raise of R the amount of current pulse

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during a half-period does not noticeably change, it decreases abruptly with increasing inductive resistance X. When the real resistance is prevalent, the current often does not reach zero during the failure of the cross piece. This indicates the possibility of several cross pieces existing under the described conditions, which are not simultaneously disrupted. An increase of the machine resistance decreases noticeably the degree of heating the parts, flashed at U_{2_0}min; whereby higher R has a greater effect than increasing X. The increasing resistance reduces the effective thermal efficiency of flashing. The increase of the machine resistance, in particular of the real resistance, causes the increase of the mean effective resistance and a reduction of the mean effective current. An increase in the machine resistance (during welding at U_{2_0}min) degrades the quality of the weld joints, in particular when the real resistance increases. This indicates the possibility of defects due to the higher resistance of the welding circuit of the machine resulting from the impaired state of the transition contacts. There are 2 tables, 7 figures and 7 Soviet references.

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The Effect of Real and Inductive Resistance of a Butt-Welding Machine in the Flash-Welding Process

Figure 2:
Dependence of the minimum idle-run voltage on the resistance of the weld
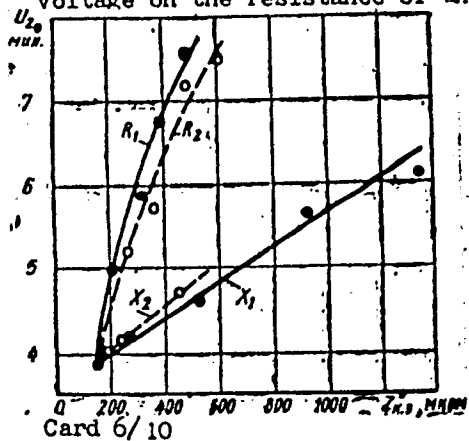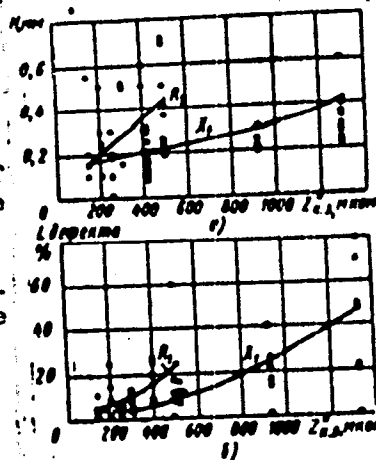
Figure 4:
Dependence of the depth of craters machine (a) and the total extent of defective areas of pipe butts (b) on the resistance of the machine (Zk. 3) when introducing additional real and inductive resistances (R_1 and X_1).

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The Effect of Real and Inductive Resistance of a Butt-Welding Machine in the Flash-Welding Process

Figure 5: Changes in temperature of flashed pipes of 32 x 3.5 mm dimensions:

a) - standard oscillogram of temperature changes during flashing process;

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The Effect of Real and Inductive Resistance of a Butt-Welding Machine in the Flash-Welding Process

Figure 5 continued:

b) - temperature distribution along the generatrix of the pipe at the end of setting at various resistances of the machine;

c) - temperature of heating the pipe at the end of flashing in spots at distances of 1.5; 5.5; 11.5 and 21.5 mm from the butt at changing R_1 (continuous line) X_1 (dotted line) and R_2 (dot-and-dash line).
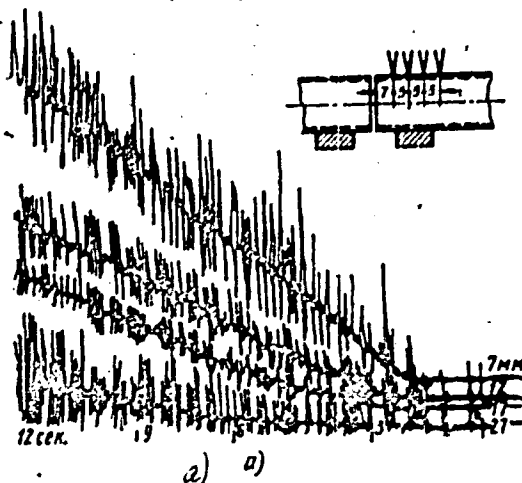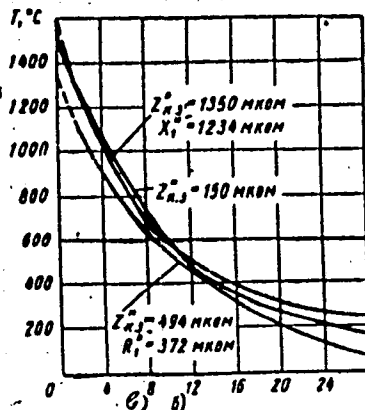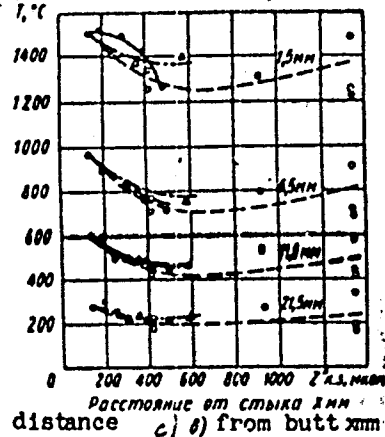
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S/135/61/000/004/001/12
A006/A101

The Effect of Real and Inductive Resistance of a Butt-Welding Machine in the Flash-Welding Process

Figure 6:

Dependence of heat content of pipes flashed at $U_{2_0}min$ (a), of mean active power b) and mean effective thermal efficiency of the flashing process (c) on the resistance of the machine at varying its real and inductive components.

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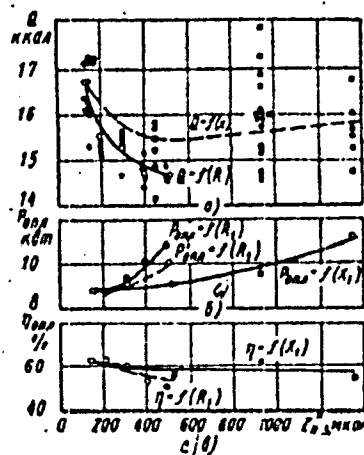
Рис. 6. Зависимости теплосодержания труб, оплавленных при U_{2} min (а), среднего значения активной мощности (б) и среднего эффективного термического к.п.д. процесса оплавления (в) от сопротивления машины при изменении его активной и индуктивной составляющих.

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Figure 7:

Dependences of the mean effective current in the welding
circuit when flashing 32 x 3.5 mm pipes (a) and of the
mean effective resistance of flashed butts (b) on the
resistance of the welding machine at varying its real
and inductive components.

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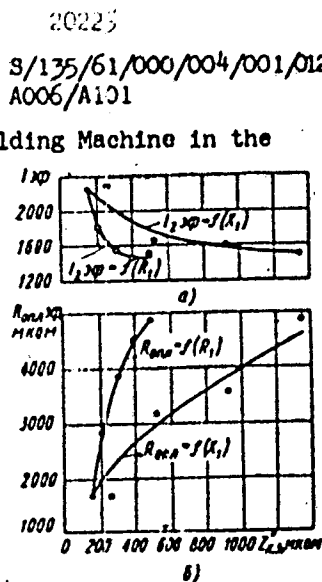
Рис. 7. Зависимости среднего эф-
фективного тока в сварочной цепи
при оплавлении труб 32×3,5 мм (а)
и среднего эффективного сопротив-
ления оплавляемых торцов (б) от
сопротивления сварочной машины
при изменении его активной и ин-
дуктивной составляющих.

GEL'MAN, A.S.

Initial electric resistance in spot welding. Avtom.svar. 14
no.7:25-32 Jl '61.   (MIRA 14:7)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i
mashinostroyeniya.
                    (Electric welding)

GEL'MAN, A.S.; GRIBEVICH, G.F., prof.; GRINEVICH, G.G.; ZOTOV, V.P.;
KOMAROV, G.V.; PAVLOV, S.M.; FIRMON, A.V.; TRUBIN, V.A., glav.
red.; SOSHIN, A.V. zam. glav. red.; YEPIFANOV, S.P., red.;
ONUFRIYEV, I.A., red.; KHOKHLOV, B.A., red.; ZIMIN, P.A., red.;
KROMOSHCH, I.L., inzh., red.; NAUMOVA, G.D., tekhn. red.

[Handbook on loading, unloading, and conveying operations in
construction]Spravochnik po pogruzochno-razgruzochnym i trans-
portnym rabotam na stroitel'stve. Pod red. G.P Grinevicha.
Moskva, Gosstroiizdat, 1962. 475 p.   (MIRA 15:9)
   (Loading and unloading) (Building materials)

S/590/62/104/000/001/006
1007/1207

AUTHOR: Gel'man, A. S. Doctor of technical Sciences, Professor

TITLE: Investigations on butt flash-welded perlitic and semiperlitic steel tubing

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya
            [Trudy], v. 104, 1962, Voprosy svarski v energomashinostroyenii, 5-29

TEXT: Results are reported of investigations carried out at the TsNIITMASh on various steel grades
of the perlitic and semiperlitic class in order to find optimum conditions for butt flash welding and inert-gas
resistance-welding of the above steel grades. After detailed description of internal structure and chemical
composition of the steel grades mentioned, the effect of the composition of steel on its behavior during flash-
welding was studied. It was shown that an increase of the chromium content up to 12%, does not markedly affect
the behavior of steel during flash-welding. The influence of welding conditiions on the quality of the resulting
joint has been the object of another series of tests. The method for program controlling welding voltage
advanced by the Institute elektrosvarski im. Paton (Institute for Electric Wleding im. Paton) was found to
markedly improve the conditions of continuous flash-welding and to widen the field of its application. Tests
were carried out on resistance-welding in a gaseous atmosphere by burning special gas-evolving cylindrical
briquettes inserted in the tubes to be welded. These tests once more confirmed the efficiency of gaseous at-
mosphere in resistance welding. The paper also reports on tests of metal-coated steel tubes; the data so far

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obtained are more of informational character, and the dependence of metal-coated steel tubes on the internal structure should be the object of further studies. Particular attention has been paid to heat-treatment conditions after flash-welding While for certain perlitic steels heat-treatment after flash-welding is not mandatory other steel grades flash-welded but not heat treated were found to have insufficient plastic joints The importance of improved heat-treatment technology for the obtaining of high-quality welded joints is stressed There are 15 figures, 14 tables and 5 references. The single English references reads Joung, I F and Chrigh, A., The effects of phosphate coating on flash welding of steel tubing, Welding Journal, no 9, 1956.

ASSOCIATION: Tsentral'nyy nauchnoi-ssledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine building)

Card 2/2

GUSAKOV, S.F., inzh., red.; GEL'MAN, A.S., inzh., red.; KLIMOVA,
G.D., red.izd-va; RODIONOVA, V.M., tekhn. red.

[Construction specifications and regulations] Stroitel'nye
normy i pravila. Moskva, Gosstroiizdat. Pt.2. Sec.D.
ch.2.[Railroad gage of 1524 mm. for industrial enterprises;
deisgn specifications] Zheleznye dorogi kolei 1524 mm pro-
myshlennykh predpriiatii; normy proektirovaniia
(SNiP II-D.2-62). 1963. 42 p.   (MIRA 17:1)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam
stroitel'stva. 2. Gosstroy SSSR (for Gusakov). 3. Gosudar-
stvennyy proyektnyy i nauchno-issledovatel'skiy institut
Promtransniiproyekt Gosstroya SSSR (for Gel'man).

45649

S/135/63/000/003/003/011
A006/A101

/ 2300

AUTHORS: Oel'man, A. S., Professor, Doctor of Technical Sciences, Mel'bard, S. N., Engineer

TITLE: The effect of current distribution over the section of flash-welded joint properties

PERIODICAL: Svarochnoye proizvodstvo, no. 8, 1963, 8 - 12

TEXT: In the investigation particular stress was laid upon studying local peculiarities of the flashing process during the stages preceding upsetting. These processes were investigated on about 40 mm^2 sections of the flash-welded butts. The data obtained from current oscillograms were compared with the properties of the weld joints. Welding experiments were performed on low-carbon steel pipes, 32 mm in diameter and walls, 4.5 mm thick. A butt welding machine, 200 kvamp power, designed by TsNIITMASh was used. To study local flash processes, the current was oscillographed on separate sections of the flash welded pipes using an eight-channel "N-102" oscillograph and standard vibrators. The pipe ends were cut into 6 segments with 3 mm wide slots. A pipe section having

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copper conductors and another section with 10 m· .mg slots, but without con-
ductors, were mounted on the machine and welded. The oscillograms show that
this method reveals individual peculiarities in the current flow on separate
sections. With the aid of this special method it was established that the he-
terogeneous properties over the section of flash-welded joints may be caused by
the local non-stability of the flash process in the stage, preceding upsetting.
Interruptions in the current flow immediately preceding upsetting on small sec-
tions of the flashed butts, during 0.02 sec and more, and flow of current with
low pulse amplitudes on these sections during the same period of time, cause lo-
cally impaired quality of the joint. The stability of the flashing process in
the stage, preceding upsetting is a most important condition for assuring the
homogeneous quality of the joint. The stability of the process, evaluated from
the summary current, is not a sufficient criterion for local flashing stability.
Short jump-like increased flashing speed preceding upsetting, increases the local
flashing ability and does not impair conditions of heating the parts to be
welded. Heterogeneity of the weld joint properties is considerably reduced.
In welding pipes 300 - 400 mm^2, flashing at increased speed should proceed within
0.15 - 0.2 sec. There are 2 tables and 7 figures.
ASSOCIATION: TsNIITMASh
Card 2/2

GEL'MAN, A.S.

Designing of industrial transportation. Biul.stroi.tekh. 22 no.5:
46-47 My '63.   (MIRA 17:3)

1. Glavnyy inzh. Gosudarstvennogo proyektnogo instituta po izyskaniyu
i proyektirovaniyu sooruzheniy promyshlennosti transporta Gosstroya
SSSR.

GRINEVICH, Georgiy Petrovich; GRINEVICH, Georgiy Georgiyevich;
    GEL'MAN, Aleksandr Samoylovich; KAZARINOV, V.M., kand.
    tekhn. nauk, nauchn. red.; GORDEYEV, P.A., red.;
    SHIROKOVA, G.M., red.

    [Comprehensive mechanization of loading and unloading
    work and transportation operations in construction] Kom-
    pleksnaia mekhanizatsiia pogruzochno-razgruzochnykh ra-
    bot i transportnykh operatsii v stroitel'stve. Moskva,
    Stroiizdat, 1964. 363 p.   (MIRA 17:6)

L 16660-65   EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(t)/EWP(k)/EWP(b)   Pf-4   AFWL/
ASD(m)-3   MJW/JD/HM
ACCESSION NR: AP4042221.   8/0135/64/000/007/0016/0019

AUTHOR: Rymkevich, A. I. (Engineer); Gel'man, A. S. (Doctor of technical sciences)

TITLE: Electroslag welding of high-alloy 10Kh18N3O3D2L and OKh12NDL steels with
low-alloy steel

SOURCE: Svarochnoye proizvodstvo, no. 7, 1964, 16-19

TOPIC TAGS: electroslag welding, highalloy steel, lowalloy steel, C, Si, Mn,
Cr, Al, Ni, Cu, strength, creep rate, impact toughness, elongation

ABSTRACT: The authors investigate three methods of welding heterogenous steels:
(1) by high-alloy rod producing an austenitic weld; (2) by low-carbon rod producing
a ferritic-pearlitic weld; (3) by alloy rod introducing Armco-iron into the welding
zone and producing welds with a pearlitic-carbide structure of sorbitic pearlite.
In electroslag welding of 10Kh18N3O3D2L steel (0.11 C, 0.52 Si, 2.78 Mn, 18.75 Cr,
3.30 Ni, 2.15% Cu) and OKh12NDL steel (0.07 C; 0.11 Si; 0.32 Mn; 12.1 Cr; 1.1 Ni
and 1.1% Cu) with a low alloy steel such as 20GSL (0.15 C; 1.22 Si; 1.47 Mn) or
15G2V (0.20 C; 0.30 Si; 1.92 Mn; 0.08 V; 0.48 W) by means of a welding rod high in
Cr and Ni, the weld metal possesses high plastic properties and impact toughness

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I. 16660-65

ACCESSION NR: AP4042221

but inadequate strength (22-24 kg/mm^2). An attempt to reinforce the weld with up to 5% Cu, 2.5% Al and 4.3% Mo failed to produce satisfactory results. The best results in combining high-alloy and low-alloy steel were obtained in employing an Sv-O4N3M rod (0.06 C; 0.13 Si; 0.45 Mn; 3.4 Ni; 0.73 Mo) and introducing Armco-iron into the weld (thickness 8 to 12 mm). Strength and plastic characteristics were then as follows: σ_T = 30 kg/mm^2; $\sigma_B \geq$ 50 kg/mm^2; $\delta \geq$ 10%; $\alpha_n \geq$5kgm/cm^2). The depth of fusion of each of the edges being welded may vary from 5 to 15 mm. The same depth of fusion produced good results in welding OKh12ND, and 10Kh18N3 3D2, steels by electroslag method with 15G2V steel. Orig. art. has: 8 figures and 3 tables.

ASSOCIATION: TsNIITMASh

SUBMITTED: 00   ENCL: 00

SUB CODE: MM   NO REF SOV: 005   OTHER: 001

Card 2/2

GEL'MAN, A.S., doktor tekhn. nauk

Ways of expanding resistance welding. Svar. proizv. no.8:1-3
Ag '64.   (MIRA 17:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i
mashinostroyeniya.

L 32255-65   EWT(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWT(k)/EWP(b)   MJW/JD/HM

ACCESSION NR: AP4049506   S/0135/64/000/011/0001/0004

AUTHORS: Kudryavtsev, F.I. (Engineer); Gel'man, A.S. (Doctor of
technical sciences)

TITLE: The effect of mechanical inhomogeneity on the fatigue
strength of weld joints

SOURCE: Svarochnoye proizvodstvo, no. 11, 1964, 1-4

TOPIC TAGS: weld joint, filler metal, parent metal, mechanical
property, fatigue strength

ABSTRACT: The effect of variable stress on the strength of weld
joints with appreciable inhomogeneity was investigated in 40Kh
type steel serving as parent metal for welds with soft fillers
and as a hard filler metal, and in St.3 type steel used as parent
metal with hard fillers and as a soft filler metal. The fatigue
strength of the two types of steel specimens was 35.5 kg/mm^2 and
19.5 kg/mm^2 respectively. All specimens were hardened and tem-
pered at 840 C and 400 C. The conspicuous difference in the
mechanical properties of a weld joint with a hard filler and soft
parent metal did not affect the fatigue strength. In specimens

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ACCESSION NR: AP4049506

with a soft layer, the strength of the filler metal was decisive whenever the thickness exceeded 0.75 of the 20 mm diameter of the specimens. A decrease in the relative filler thickness below a critical thickness enhanced the resistance to weld fatigue. Apparently, this effect resulted from the state of stress that expands throughout the filler metal. Surface machining had a beneficial effect on fatigue strength of specimens with a soft filler whatever its thickness. In specimens with a thin filler metal, the fatigue strength of the work-hardened filler approximated that of the parent metal. The findings of the authors hold for inhomogeneous weld joints without stress centers and it may be assumed that the presence of such centers would change the pattern of stress propagation.   O r i g. art. has: 8 figures and 1 table.

ASSOCIATION: TsNIITMASH

SUBMITTED: 00   DATE ACQ: ENCL: 00

SUB CODE: MM   NR REF SOV: 006   OTHER: 000
Card   2/2

L 55950-65   EPA(s)-2/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(t)/T/EWP(b)/EWP(k)/EWP(t)/
EWA(c)   Pf-4/Pad   IJP(c)   MJW/JD/HM/HW/JG

ACCESSION NR: AR5008969   S/0137/65/000/001/E024/E024

SOURCE: Ref. zh. Metallurgiya, Abs. 1E135   621.791.765

AUTHOR: Rymkevich, A. I.; Gel'man, A. S.

TITLE: Joining dissimilar steels by electroslag welding

CITED SOURCE: Tr. Leningr. metal. z-da, v. 11, 1964, 152-166

TOPIC TAGS: metallurgy, ferrous metal, welding

TRANSLATION: Electroslag welding of dissimilar steels was studied. It was found
that electroslag welding of high strength steels of the augtenite-ferrite class
(10Kh18N3G3D2L) or the ferrite-martensite class (OKh12NDL) with low-alloy steels
(for example, 20GSL) may result in a seam close in composition to the high-alloy
steel, with possible deviation of the actual composition from that intended. This
causes unwanted variations in the mechanical properties of the seam metal. When
these steels are electroslag welded with rod which has a high chromium and nickel
content, the seam metal has high ductility and a_k with low strength (σ_s=22-24 kg/
mm²). The optimum combination of ductility and strength (σ>30 kg/mm², σ_b>50 kg/
mm², ρ>10%, a_k>5 kg/cm²) in welded joints between high-alloy steel (10Kh18N7G3D2L

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L 55950-65
ACCESSION NR: AR5008969

or OKh12NDL) and low-alloy steel (20GSL) can be obtained by electroslag welding with CbO4N2M rod (C=0.06%, Ni=3.0-3.5%, Mo=0.6-0.9%), with additional introduction into the seams of Armco iron in a thickness of 8-12 mm in the form of a consumable welding tip or as facing on the welded edges. The melting depth of each edge being welded should not exceed 15 mm.

SUB CODE: MM, IE   ENCL: 00

Card 2/2

GEL'MAN, A.S.; MEL'BARD, S.N.

Some characteristics of the flash butt welding process. Avtom.
(MIRA 18:1)
svar. 17 no.6:39-43 Je '64

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii
i mashinostroyeniya.

L 1895-66   EWT(d)/EPA(s)-2/EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(1)
ACCESSION NR: AP5021573 EWA(c)   JI/HM   UR/0286/65/000/013/0046/0046
                                                        621.791.762.5

AUTHOR: Mel'bard, S. N.; Gel'man, A. Sh.; Slepak, E. Sh.; Ovchinnikov, A. S.

TITLE: Method of automatic control of flash butt welding.   Class 21, No. 172413

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 13, 1965, 46

TOPIC TAGS: welding, flash welding, continuous flash butt welding, fusion current, automatic control

ABSTRACT: An Author Certificate has been issued for a method of automatic control of continuous flash welding. The control, based on welding-current changes with time, operates on the magnitude and sign of the imbalance between the given and actual values of the fusion current using a controlled choke coil.   [MS]

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashino-stroyeniya (Central Scientific Research Institute of Technology and Machine Building)

SUBMITTED: 26Dec63   ENCL: 00   SUB CODE: IE
NO REF SOV: 009   OTHER: 000   ATD PRESS: 4090

Card 1/1

GEL'MAN, A.S., prof., doktor tekhn. nauk; SLEPAK, E.S., kand. tekhn. nauk;
MEL'BARD, S.N., kand. tekhn. nauk; VIVSI, S.N., inzh.

Present state and prospects for the development of butt joint
welding of pipe heating surfaces. Teploenergetika 12 no.11:
63-66 N '65.   (MIRA 18:10)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii
i mashinostroyeniya i ZIO.

GEL'MAN, A.S.

The nature of friction welding. Avtom. svar. 18 no.3:5-10
Mr '65.   (MIRA 18:6)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii
i mashinostroyeniya.

L 21748-66   EWT(m)/EWP(v)/T/EWP(t)/EWP(k)   JD/HM

ACC NR: AP6005890   SOURCE CODE: UR/0096/65/000/011/0063/0066

AUTHOR: Gel'man, A. S. (Professor, Doctor of technical sciences);
Slepak, E. S. (Candidate of technical sciences); Mel'bard, S. N.
(Candidate of technical sciences); Vivsi, S. N. (Engineer)

ORG: TSIITMASH, ZiO

TITLE: Present state and future prospects for the development of butt
welding of the tubes of a heating surface

SOURCE: Teploenergetika, no. 11, 1965, 63-66

TOPIC TAGS: welding technology, heating engineering, flash welding,
high frequency

ABSTRACT: At the present time, the main industrial process used for
joining the tubes of heating surfaces is flash butt welding. This
welding method, which produces joints of sufficiently high quality,
is accompanied by the formation of a large bur which is difficult to
get rid of. The present article is a review of recent work in the
Soviet Union aimed at improving the quality of heating surfaces by
better control of the heating process during flash and contact welding
and by the development of techniques for tube butt welding using high

Card 1/2   UDC: 621.643.411.4

L 21748-66

ACC NR: AP6005890

frequency currents. Results obtained in various of the experiments are illustrated graphically and with oscillograms. Orig. art. has: 7 figures and 2 tables.

SUB CODE: 13/ SUBM DATE: none

Card 2/2

ACC NR: AP6034621   SOURCE CODE: UR/0380/66/000/006/0066/0072

AUTHOR: Gel'man, A. S. (Moscow); Prokof'yev, V. N. (Moscow); Furman, F. A. (Moscow)

ORG: none

TITLE: Wave processes in hydraulic couplings of hydraulic transmissions

SOURCE: Mashinovedeniye, no. 6, 1966, 66-72

TOPIC TAGS: vibration propagation, sound propagation, vibration transmission, fluid flow, flow analysis, HYDRAULIC ENGINEERING

ABSTRACT: The propagation of a sound wave in a hydraulic pressure line consisting of a system of two pipes and two vessels filled with an elastic fluid is investigated, and the influence of the vessels on the propagation mechanism of the sound wave is determined. From a fluid's differential equations of motion and continuity, considering its initial and sectional boundary conditions, and applying Fourier and graphic computation methods, an equation is derived which permits the pressure and the flow velocity at any point in the system to be determined. As demonstrated by a numerical example, a sudden inflow-pressure change effects in the next vessel a harmonic pressure change of an amplitude equal to the pressure jump and of a lag equal to the pressure wave's propagation time to the vessel. The pressure fluctuation frequency is influenced by the presence of the second vessel, and the natural fluctua-

Card 1/2   UDC: 532.542

ACC NR: AP6034621

tion period of the first vessel, considering it as a resonator, decreases by the effect of the second vessel proportionally to a given factor. Orig. art. has: 4 figures and 12 formulas. [WA-98]

SUB CODE: 13, 20/ SUBM DATE: 19May65/ ORIG REF: 004/ OTH REF: 002/

Card 2/2

GEL'MAN, A   S   Ed.

Promyshlennyy Transport. Pod red. A.S. Gel'mana
i A.V. Federov. Moskva, Gosstroyizdat, 1960.
431 p. illus., diagrs., graphs, maps, tables
(Spravochnik Proyektirovshchika Promyshlennykh,
Zhilykh i Grazhdanskikh Zdaniy i Sooruzheniy)
At head of title: Glavstroyproyekt pri Gosstroye
SSSR, and Gosudarstvennyy Proyektnyy Institut po.
Proyektirovaniyu Promshlennogo Transporta (Promtrans-
proyekt)

Apparatus for annealing high-voltage insulators. A. T. GELMAN and B. G
Snikov RV. Russ 10,518, Feb. 28, 1931.

METALLURGICAL LITERATURE CLASSIFICATION

A

Tunnel kiln for firing chinaware. A. T. Csel'man and K. G. Nauov'ky. Russ. 67,078, May 31, 1946. Between the firing zone and the preheating zone are installed by passes and atomizers. Their function is to regulate the gaseous medium independently of the burners in the firing zone.   M. Ho

GEL'MAN, A.T.

"The ceramic industry in the USSR and the outlook for its development,"
Authors: A.S.Berkman, G.L. Bruk, A.T. Gel'man (et al.), in symposium:
Syr'yevyye resursy tonkokeram. prom-sti SSSR i puti ikh ispol'zovaniya,
Moscow-Leningrad, 1948, p. 7-3?

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

PROCESSES AND PROPERTIES INDEX

/C

High-Temperature Laboratory Furnace. (In Russian.)
D. B. Ginzburg and A. T. Gelman. Ogneupory (Refractories), v. 14, Oct. 1949, p. 463–466.
　Describes above, incorporating air preheating and using low-pressure oil burners. Temperatures up to 1760°C. may be obtained. Design details are illustrated schematically. Specific characteristics are indicated.

METALLURGICAL LITERATURE CLASSIFICATION

C A

Laboratory flame furnaces for firing ceramic mixes and for decomposing. D. B. Ginsburg and A. T. Gal'man. Steklo i Keram. 7, No. 8, 16-18(1960); cf. C.A. 43, 8013g.— Illustrated descriptions of furnaces with rotary bottom, for temps. up to 1560°, light lining and simple metal recuperator, for temps. up to 1580°, and needle-like recuperator, for temps. up to 1750°. B. Z. Kamich

'Vibrating ball mill. A. T. Qel'man, A. I. But, and S. A. Berzon. U.S.S.R. 107,190, Aug. 25, 1957. Structural d.—M. H.—

1. NOVIKOV, V. A., KICHIGIN, N. K., ENG., YUDIN, V. L., MARKOV, A. L., GLIKIN, A. Ya.

2. USSR (600)

4. Motor Trucks

7. UKAP – TsINS universal truck with conveyer-loader. Mekh. trud. rab. 6, no. 10, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Uncl.

1. GEL'MAN, A.YA., NOVIKOV, V.'. KICHIGIN, N.M., YEMSTOV, V.G., KAZDOVIN, A.S.

2. USSR (600)

4. RESERVOIRS

7. Cleaning water supply reservoirs at sugar factories. Sakh.prom. 26, no. 12, 1952

9. Monthly List of Russian Accessions, Library of Congress, ____February____1953. Unclassified.

GEL'MAN, A.Ya.

    Automation of sugar factory boiler rooms fired with liquid fuel.
    Sakh.prom. 36 no.5:35-40 My '62.   (MIRA 15:5)

    1. Kiyevenergonaladka.
                (Boilers)   (Automatic control)

GEL'MAN, A. YE.

GEL'MAN, A. YE.   "The Reduceability of One Class of Systems of Differential
Equations with Quasi-Periodic Coefficients." Leningrad
Order of Lenin State U imeni A.A. Zhdanov. Leningrad, 1956.
(Dissertation for the Degree of Candidate in Physicomatha-
matical Science)

So: Knizhnaya Letopis', No. 18, 1956.

GEL MAN, A.E.

AUTHOR: GEL'MAN, A.Ye.   20-4-3/51

TITLE: On the Reducibility of a Class of Systems of Differential
            Equations With Quasiperiodic Coefficients (O privodimosti
            odnogo klassa sistem differentsial'nykh uravneniy s kvaziperiodiches-
            kimi koeffitsiyentami)

PERIODICAL: Doklady Akad. Nauk SSSR,   1957, Vol.116, Nr.4, pp.535-537 (USSR)

ABSTRACT: Let $f(t)$ be quasiperiodic. Let $\bar{f}(\lambda) = \sum_{j=0}^{\infty} a_j \lambda^j$, $a_j > 0$;

$\lim_{j \to \infty} a_j = 0$. $\bar{f}(\lambda)$ is called a corresponding majorant of $f(t)$,

denoted with $f(t) \lessgtr \bar{f}(\lambda)$, if $f(t) = \sum_{j=0}^{\infty} P_j(t)$ converges uniformly,
where

$$P_j(t) = \sum_{|m_1| + \ldots + |m_n| \leq j} \eta_{m_1 m_2 \ldots m_n} e^{it(m_1 \omega_1 + \ldots + m_n \omega_n)}, \quad |P_j(t)| \leq a_j.$$

From $f_1(t) \lessgtr \bar{f}_1(\lambda)$, $f_2(t) \lessgtr \bar{f}_2(\lambda)$ there follows: 1) $f_1 + f_2 \lessgtr \bar{f}_1 + \bar{f}_2$,

2) $f_1 \cdot f_2 \lessgtr \bar{f}_1 \cdot \bar{f}_2$, 3) $F(t) = e^{At} \int_t^{\infty} f_1(x) e^{-Ax} dx \lessgtr \dfrac{\bar{f}_1(\lambda)}{A}$ (A > 0),

Card 1/2

On the Reducibility of a Class of Systems of Differential   20-4-3/51
Equations With Quasiperiodic Coefficients

4) $|f_1| \leq |\overline{f}_1(1)|$ if the series converges for $\overline{f}_1$ as $\lambda = 1$.

Theorem 1: Given the equation of Riccati $\dot{c} = \xi(t) + f(t)\,c + r(t)\,c^2$, where ξ, f, r are quasiperiodic. If there exist $\overline{\xi}(\lambda), \overline{f}(\lambda), \overline{r}(\lambda)$ (where the radii of convergence are corresponding series > 1) such that $\xi(t) \leq \overline{\xi}(\lambda)$, $f \leq \overline{f}$, $r \leq \overline{r}$, $\overline{f}(1) + 2\sqrt{\overline{\xi}(1)\overline{r}(1)} < 2\overline{f}(0)$, then there exists a quasiperiodic solution $c(t)$ and the corresponding $\overline{c}(\lambda)$ with the radius of convergence > 1 and $c(t) \leq \overline{c}(\lambda)$.

Theorem 2: Given the system $\dot{x} = P_{11}(t)x + P_{12}(t)y$; $\dot{y} = P_{21}(t)x + P_{22}(t)y$, where the radii of convergence of $\overline{P}(\lambda)$ are greater than 1. Let the equation $\dot{c} = P_{12} + (P_{22} - P_{11})\,c - P_{21}\,c^2$ satisfy the conditions of theorem 1. Let the numbers $\omega_1, \omega_2, \ldots, \omega_n$ be algebraic (eventually with the exception of a common factor). Then the given system is reducible (cf. Erugin [Ref. 1]).

ASSOCIATION: Leningrad Electrotechnical Institute im. V.I. Ul'yanov (Lenin)
            (Leningradskiy elektrotekhnicheskiy institut im. V.I. Ul'yanova (Lenina))
PRESENTED BY: V.I. Smirnov, Academician, January 4, 1957
SUBMITTED: December 28, 1956
AVAILABLE: Library of Congress

Card 2/2

66817

SOV/155-58-5-6/37

16(1) 16 2600

AUTHOR: Gel'man, A.Ye.

TITLE: Some Estimations for the Function of the Type

$$x(t) = \frac{2}{\pi} \int_0^\Omega \frac{\sin \omega t}{\omega} R(\omega) d\omega$$

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki,1958,Nr 5,pp 29-30 (USSR)

ABSTRACT: Let $R(\omega)$ be summable on $(0,\Omega)$ and almost everywhere positive. Let

$$I_0 = \int_0^\Omega R(\omega)d\omega \quad , \quad I_2 = \int_0^\Omega \omega^2 R(\omega)d\omega \quad , \quad x(t) = \frac{2}{\pi}\int_0^\Omega \frac{\sin \omega t}{\omega} R(\omega)d\omega$$

$$X = \sup_{0 < t < \infty} x(t) \; .$$

Then it is

$$X > \frac{2}{\pi} I_0 \sqrt{\frac{I_0}{I_2}}$$

A:S

SUBM.

Theorem : Let $R(\omega)$ satisfy the conditions of the preceding

Card 1/2

-- imeni

Card 2

AUTHOR: Gel'man, A.E.   20-118-6-3/43

TITLE: A Sign of the Existence of Certain Classes of Solutions of
            a Nonlinear Differential Equation and Some Estimations in the
            Method of the Small Parameter (Odin prisnak sushchestvovaniya
            opredelennykh klassov resheniy nelineynogo differentsial'nogo
            uravneniya i nekotoryye otsenki v metode malogo parametra)

PERIODICAL: Doklady Akademii Nauk, 1958, Vol 118, Nr 6, pp 1063-1065 (USSR)

ABSTRACT: The author considers the very general system

$$L(y) = \psi(t) + F(t,y,y',\ldots,y^{(n)}),$$

where $L(y)$ is a linear differential expression, $\psi(t)$ is bounded
and measurable and F is analytic in the neighborhood of the
zero point, $F(t,0,0,\ldots,0) = 0$. By majorising of F the author
obtains assertions on the existence of bounded solutions being
periodic, quasiperiodic or almost-periodic, respectively. The
absolute value of the solutions is estimated by the real parts
of the zeros of the characteristic equation of $L(y)$ and by the

            smallest positive root of the equation $\phi'(x) + \frac{\Psi}{x} = 1$, where

Card 1/2 $\phi(x)$ is the majorant of F. The same investigations are valid

A Sign of the Existence of Certain Classes of Solutions of   20-118-6-3/43
a Nonlinear Differential Equation and Some Estimations in the
Method of the Small Parameter

for the case that ψ and $\mathcal{F}$ depend moreover on a small
parameter λ.
There are 3 references, 2 of which are Soviet.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut imeni V.I.Ulyanova
(Lenina) (Leningrad Electrotechnical Institute imeni V.I.
Ulyanov (Lenin))
PRESENTED: September 12, 1957, by V.I.Smirnov, Academician
SUBMITTED: May 22, 1957

Card 2/2

16(1)

AUTHOR: Gel'man, A.Ye.   SOV/20-123-5-3/50

TITLE: The Method of the Small Parameter for Operator Equations
           (Metod malogo parametra dlya operatornykh uravneniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958,Vol 123,Nr 5,pp 782-784 (USSR)

ABSTRACT: Let Y be a space of the type B and let Y_λ be the linear system of

all formal power series $y(\lambda) = \sum_{k=0}^{\infty} y_k \lambda^k$, $y_k \in Y$. Let $y(\lambda) \lessgtr \sum_{k=0}^{\infty} x_k \lambda^k$

mean that $\|y_k\| \leq x_k$. If $\sum_{k=0}^{\infty} x_k \lambda^k$ is convergent, then let it be

equal to $x(\lambda)$. Then let $y(\lambda) \lessgtr x(\lambda)$.
Theorem: Let the operator Ω_λ satisfy the following conditions:

1) Ω_λ maps Y_λ onto itself, where $\Omega_\lambda[y(\lambda)] = \Omega_0(0) + \sum_{k=1}^{\infty} \lambda^k \omega_k(y_0, y_1, .., y_{k-1})$,

where ω_k maps the set of k-dimensional vectors with components
of Y onto Y. 2) There exists a double series $\overline{\Omega}(\lambda, x) = $

Card 1/2 $a + \lambda \sum_{i,j=0}^{\infty} a_{ij} x^i \lambda^j$ with positive radii of convergence so that for

The Method of the Small Parameter for Operator Equations SOV/2C-123-5-3/3

$y(\lambda) \leqslant x(\lambda)$, $x(0) < R$ (R radius of convergence of the series $\Omega(\lambda, x)$ with respect to x) there holds: $\Omega_\lambda[y(\lambda)] \leqslant \overline{\Omega}[\lambda, x(\lambda)]$.

3) $\|\Omega_0(0)\| < R$. Then it holds: a) the equation $y = \Omega_\lambda(y)$ has a unique solution in Y_λ ; b) this solution converges for $|\lambda| < \Lambda$, $\Lambda = \sup_{0 < x < k} \lambda$, where $x = \overline{\Omega}(\lambda, x)$; c) $y(\lambda) \leqslant x(\lambda)$, where $x(\lambda)$ is the unique solution of the equation $x = \overline{\Omega}(\lambda, x)$, analytic with respect to λ.

A second theorem is concluded from the first one and it has a similar contents.

There are 6 references, 4 of which are Soviet, 1 French, and 1 American.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut imeni V.I.Ul'yanova (Lenina) (Leningrad Electrotechnical Institute imeni V.I. Ul'yanov (Lenin))

PRESENTED: July 11, 1958, by V.I.Smirnov, Academician
SUBMITTED: June 25, 1958

Card 2/2

S/044/61/000/008/013/039
C111/C333

AUTHOR: Gel'man, A. Ye.

TITLE: On the question concerning the periodic solution of the
             differential equation of the synchronous motor

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 28,
             abstract 8B125.("Izv. Leningr. elektrotekhn. in-ta", 1959
             39, 285-291)

TEXT: The author gives new conditions for the existence of a
periodic solution in x of the equation

$$\ddot{x} + f_1(x)\,\dot{x} = f_2(x),$$

where $f_1(x)$, $f_2(x)$ are periodic functions. A method is given, with the
aid of which this solution can be determined as a uniformly convergent
series of periodic functions. The remainder term of the series ob-
tained is estimated. It is noted that, if $f_1(x)$, $f_2(x)$ are trigonometric
polynomials, the series mentioned consists of trigonometric polynomials
too; this case proves, according to the opinion of the author, the

Card 1/2

On the question concerning the . . .   S/044/61/000/008/013/039
C111/C333

advantage of the new method compared with the method of V. A. Tabuyeva.

[Abstracter's note: omplete translation.]

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Card 2/2

GEL'MAN, A.Ye.

16(1)

PHASE I BOOK EXPLOITATION   SOV/2660

Vsesoyuznyy matematicheskiy s"yezd. 3rd, Moscow, 1956

Trudy, t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: O.M. Savchenko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.N. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Ya. V. Prokhorov, K.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, N.G. Chetayev, O. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

Volkov, D.N. (Leningrad). Certain generalizations of the concept of energy and problems of stability for partial differential equations   16

Serdin, E.P. (L'vov). On the behavior of solution of linear elliptic systems in the neighborhoods of certain singular manifolds   16

Ol'shanskiy, A.S. (Leningrad). On the reducibility of systems of differential equations with quasiperiodic coefficients   17

Schur, N.A. (Gor'kiy). Description of monotone singular points of a dynamic system on the plane by means of the course points of proximate systems   18

Ratin, A.A. (Moscow). On the solvable extensions of linear differential operations of the first order   18

Drapkin, L.E. (L'vov). On one method of determining the asymptotic properties of the eigenvalues and eigenfunctions for elliptic system.

Card 1/31

2

16(1)

AUTHOR: _Gel'man, A.Ye.   SOV/20-127-5-2/58

TITLE: Theorems on Implicit Abstract Functions and Problems of
            Stability for Operator Equations

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 127,Nr 5,pp 945-948 (USSR)

ABSTRACT: Let ϕ, $\mathcal{Y}$, Z be metric spaces, the operator $\Omega(\varphi, y)$ is
            assumed to map $\phi \times \mathcal{Y}$ into Z .

$$\bar{\Omega}'_y \left(\varphi_0, y_0 \right) =$$

$$= \lim_{\substack{\lambda \to 0 \\ x \to 0}} \sup_{\substack{\rho_\phi(\varphi_0, \varphi) < \lambda, \ \rho_\mathcal{Y}(y_2, y_0) < x \\ \rho_y(y_1 y_0) < x, \ y_1 \ne y_2}} \frac{\rho_z \left[\Omega(\cdot, y_2) - \Omega_1(\varphi, y_1) \right]}{\rho_y(y_2, y_1)}$$

is denoted as Lipschitz derivative of $\Omega(\varphi, y)$ with respect to
y in the point (φ_0, y_0) .

Theorem 1 : Let 1.) ϕ, $\mathcal{Y}$ be metric spaces, 2.) let $\Omega(\varphi, y)$

Card 1/3

Theorems on Implicit Abstract Functions and Problems   SOV/20-127-5-2/58
of Stability for Operator Equations

map $\phi \times \mathcal{O}_f$ into $\mathcal{Y}$, 3.) let $(\cdot_o, y_o) \in \mathcal{O} \cdot \mathcal{C}$ exist so that
$y_o = \varepsilon(\cdot_o, y_o)$ 4.) let $\mathcal{L}(\varphi, y_o)$ be continuous in $\cdot_o$,
5.) let $\mathcal{L}'(\varphi_o, y_o)$ exist and be < 1 , 6.) let a complete
metric space Y exist which is formed of elements of $\mathcal{O}$ with
the metric of $\mathcal{O}_f$ so that a.) $\mathcal{L}(\mathcal{C}, Y) \subset Y$ b.) $y_o \in Y$.
Then there exist numbers $\lambda > 0$, $\overline{x} > 0$ and a uniquely de-
termined operator $y(\varphi)$ which maps the λ -neighborhood of φ_o
into the $\overline{x}$-neighborhood of the point y_o and satisfies
there the equation $y = \mathcal{L}(\cdot, y)$. This operator is continuous
in φ_o and maps the mentioned λ -neighborhood into Y .

With the aid of this theorem the author investigates in theorem
2 the solution $\dot{u}(\varphi)$ of the system of operator equations

(1) $L(u) = \omega(u)$, $A(u) = \varphi$.

Qualitative as well as quantitative statements are obtained.

Card 2/3

Theorems on Implicit Abstract Functions and Problems   SOV/20-127-5-2/58
of Stability for Operator Equations

Several well-known results of the theory of non-linear different-
ial equations are obtained as special cases, e.g. the theorems
of Lyapunov [Ref 2] on the stability in the noncritical case.

Altogether there are 4 theorems and 3 lemmata.
There are 5 references, 2 of which are Soviet, 2 German,
and 1 Swedish.

ASSOCIATION: Leningradskiy elektro-tekhnicheskiy institut imeni V.I.
Ul'yanova (Lenina) (Leningrad Electrotechnical Institute imeni
V.I. Ul'yanov (Lenin))

PRESENTED: April 27,1959, by V.I. Smirnov, Academician
SUBMITTED: April 17,1959

Card 3/3

GEL'MAN, A.Ye., kand.fiziko-matematicheskikh nauk

Problem concerning the periodic solution of the differential
equation of a synchronous motor. Izv. LETI 57 no.39:285-291
'59.   (MIRA 15:10)
              (Differential equations)
              (Electric motors, Synchronous)

GEL'MAN, A.Ye.

Asymptotic formulas for coefficients of one class of power
series. Vest. LGU 15 no.19:19-28 '60.   (MIRA 13:9)
(Series)

16. 4100

AUTHOR: Gel'man, A. Ye.

TITLE: Some Asymptotic Formulas for the Coefficients of a Class of Degree Series

TEXT: The functions

$$f_1(\lambda) = \sum_{k=0}^{\infty} a_k \lambda^k \quad \text{and} \quad f_2(\lambda) = \sum_{k=0}^{\infty} b_k \lambda^k$$

are called equal in the limit (in symbols: $f_1(\lambda) \rightrightarrows f_2(\lambda)$), if

$$\lim \frac{a_k}{b_k} = 1.$$

Definition: $f(\lambda) = \sum_{k=0}^{\infty} a_k \lambda^k$ is called correct, if

1.) $a_k > 0 \ (k \geqq 0)$; 2.) $\sum_{k=0}^{\infty} a_k$ converges; 3.) $\lim \frac{a_{k-1}}{a_k} = 1$;

4.) it exists a c so that for all $n' > \frac{n}{2}$ it holds $\frac{a_{n'}}{a_n} < c.$

Card 1/4

84906

S/043/60/019/004/009/015XX
C 111/ C 333

Some Asymptotic Formulas for the Coefficients of a Class of Degree Series

Lemma 1: If $\lim \frac{a_{n-1}}{a_n} = 1$, then there exists an increasing function $m(n)$ so that

1. $\lim\limits_{n \to \infty} m(n) = \infty$;   2. $\lim\limits_{n \to \infty} \max\limits_{0 \leq m \leq m(n)} \left| \frac{a_{n-m}}{a_n} - 1 \right| = 0.$

Lemma 2: If $\frac{a_i}{a_n} \leq c$ for $i \geq \left[\frac{n}{2}\right]$ and all n, then it is

$\frac{a_i}{a_n} \leq cp^{\lg_2 c}$ for $i \geq \left[\frac{n}{p}\right]$, $p \geq 2$ for all n.

Theorem: If $\varphi_1(\lambda)$ and $\varphi_2(\lambda)$ are correct functions, then it is

$$\varphi_1(\lambda) \cdot \varphi_2(\lambda) \Longrightarrow \varphi_1(1) \cdot \varphi_2(\lambda) + \varphi_2(1) \cdot \varphi_1(\lambda).$$

Corollary: The product of two correct functions is a correct function.

Consequence by induction from n to n+1:

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S/043/60/019/004/009/015XX
C 111/ C 333

Some Asymptotic Formulas for the Coefficients of a Class of
Degree Series

$$\prod_{k=1}^{n} \frac{\varphi_k(\lambda)}{\varphi_k(1)} \;\rightrightarrows\; \sum_{k=1}^{n} \frac{\varphi_k(\lambda)}{\varphi_k(1)}$$

Theorem 2: Let $P_n(x)$ be a polynomial of n-th degree, $\varphi(\lambda)$ correct
function $P_n[\varphi(1)] \not= 0$. Then it is

$$P_n[\varphi(\lambda)] \;\rightrightarrows\; P_n'[\varphi(1)]\,\varphi(\lambda).$$

Theorem 3: Let $f(x) = \sum_{k=0}^{} b_k x^k$; $\varphi(\lambda)$ correct function; the

point $x = \varphi(1)$ is assumed to lie in the region of convergence of
the series $f(x)$; let $f'[\varphi(1)] \not= 0$. Then it is

$$f[\varphi(\lambda)] \;\rightrightarrows\; f'[\varphi(1)]\,\varphi(\lambda).$$

Example: $\varphi(\lambda) = \sum_{k=1}^{\infty} \frac{\lambda^k}{k^2}$, $f(x) = \sin x$. Then it is

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C 111/ C 333

Some Asymptotic Formulas for the Coefficients of a Class of
Degree Series

$$\sin \left(\sum_{k=1}^{\infty} \frac{\lambda^k}{k^2} \right) \rightrightarrows \cos \frac{\pi^2}{6} \cdot \sum_{k=1}^{\infty} \frac{\lambda^k}{k^2} \cdot \qquad \chi$$

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16-7600   S/020/60/132/03/03/066

AUTHOR: Gel'man, A.Ye.

TITLE: Theorems on an Implicit Abstract Analytic Function

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 501-503

TEXT: Let Y, ϕ and Z be complex Banach spaces. The function $\Omega(y, \varphi)$ with values in Z defined in the region D of the space $Y \times \phi$ is called analytic in D in the variables y, φ if it is unique and continuous as a function of the point (y, φ) and if in D it is G-differentiable with respect to y and φ (terminology of Hill (Ref. 1)). Without proofs the author formulates three long theorems on implicit analytic functions. From the qualitative part of these theorems there follow the classical theorems a) of Weierstraß on implicit analytic functions, b) of Poincaré on the series development of the solution of a differential equation with respect to a parameter, c) of Lyapunov on holomorphic solutions of systems of differential equations, etc. The part as to quantity of the theorems permits an estimation of the region of convergence

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Theorems on an Implicit Abstract Analytic   S/020/60/132/03/03/066
Function

and the remainder terms of the mentioned nonlinear problems.
There are 2 non-Soviet references.

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16.3400

AUTHOR: Gel'man, A.Ye.

TITLE: On periodic, quasiperiodic and bounded solutions of a class
            of linear differential equations

TEXT: The author considers the linear differential equation

$$y'' + [A + \varphi_1(t)]y' + [B + \varphi_2(t)]y = f(t), \qquad (1)$$

where A and B are constants, $\varphi_1(t)$, $\varphi_2(t)$, $f(t)$ for $-\infty < t < +\infty$ are

bounded functions integrable on every finite interval, where the roots
k_1 and k_2 of the equation

$$k^2 + Ak + B = 0 \qquad (2)$$

are so that $\alpha_s = \operatorname{Re} k_s \neq 0$ $(s=1,2)$ and $d = |k_2 - k_1| \neq 0$. It is proved

that if the inequality

$$\left(\left| \frac{k_1}{\alpha_1} \right| + \left| \frac{k_2}{\alpha_2} \right| \right) \sup |\varphi_1(t)| + \left(\left| \frac{1}{\alpha_1} \right| + \left| \frac{1}{\alpha_2} \right| \right) \sup |\varphi_2(t)| < d$$

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